

**EXPERIMENTAL EVALUATION OF SAND CEMENT  
BRICKWALL AS LOAD BEARING STRUCTURE**

**HASMUNIR BIN HAMID**

Report is submitted as  
the requirement for the degree of  
**Bachelor Engineering (Hons) (Civil)**

**MARA UNIVERSITY OF TECHNOLOGY  
MARCH 2005**

## DECLARATION

I, HASMUNIR BIN HAMID, UiTM no. 2002634086, confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.

---

(HASMUNIR BIN HAMID)  
(8 MARCH 2005)

## **ABSTRACT**

The birth of alternative construction techniques and new construction materials have offer many advantages as compared to the traditional construction methods and basic materials. Bricks are normally used as infill materials in framed structures in conventional design and construction of buildings. However, research has shown that bricks can also be used as an external and internal load bearing walls, where the structural masonry aided cheaper and faster construction. Load bearing walls were introduced in buildings as cost savings. The cost savings come in the form of less beam column framing system, smaller foundation, speedy erection, shorter construction time and finally reduced labour costs. In comparison to reinforced concrete framed buildings, which are by far most common found in Malaysia, new market for buildings constructed on load bearing walls using bricks need to be investigated. Wall is always known as a structural element used to divide or enclose spaces in building to form the periphery of a room or a building. This study determined the capability sand cement bricks to withstand load in load bearing wall system. It enhanced new construction methods to provide alternative and cost effective technique in the nation's building industry. Investigation was carried out by erecting three of sand cement brick walls of the size 1000mm x 1000mm and half brick thick. The structural behaviour of these brick walls due to compressive axial showed sand cement brick wails are suitable to be used as load bearing wall. From the study, it can be concluded that sand cement brick wall showed better performance as load bearing wall, with maximum lateral displacement of 7.29mm, vertical deflection of 5.84 mm and ultimate load of 309.5 kN.

## **TABLE OF CONTENT**

### **CONTENT**

	<b>PAGE</b>
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
LIST OF TABLE	iv
LIST OF FIGURE	iv
LIST OF PHOTO	v
1.0 INTRODUCTION	1-2
1.1 Problem Statement	3
1.2 Objective	3
1.3 Scope and Limitation of the Research	3
1.4 Research Method	4
2.0 LITERATURE REVIEW	
2.1 Walls	6-8
2.1.1 Type of Brick walls	8-11
2.1.2 Bricklaying Terms	11-13
2.1.3 Sand Cement Bricks	14-15
2.2 Mortar	16
2.2.1 Type of Mortar	17-18
2.3 Failure Sand Cement Brick wall Under Axial Loading	19

### 3.0 METHODOLOGY

3.1 Mortar Mix	20
3.1.1 Cement	21
3.1.2 Water	21
3.1.3 Sand	22
3.2 Compression Strength Test	22
3.2.1 Procedure	22-24
3.3 Specimens Preparation	25-28
3.4 Specimens Set Up	29-30
3.5 Tests on Brick walls	31-35

### 4.0 RESULT AND DISCUSSION

4.1 Mortar Mix Result	36
4.2 Brick Wall Result	37-45

### 5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion	46
5.2 Recommendations	47

REFERENCES	48-49
------------	-------

### APPENDIXES